# Agilent

InfiniiScan Event Identification Software for Infiniium 80000 and 8000 Series Oscilloscopes (N5414A and N5415A)

Data Sheet

Identify signal integrity issues quickly and easily

Agilent Technologies' InfiniiScan software allows you to use an oscilloscope to identify signal integrity issues in your electronic designs. The Agilent InfiniiScan event identification software quickly and easily identifies signal integrity issues. This innovative software scans through thousands of acquired waveforms per second to help you isolate anomalous signal behavior.

Today's digital signals are increasingly complex. Designers of serial links and parallel busses want to quickly identify signal anomalies in their designs. Engineers have traditionally relied on hardware triggering and deep memory to capture such illusive events. However, these classic methods fall short in some key areas.
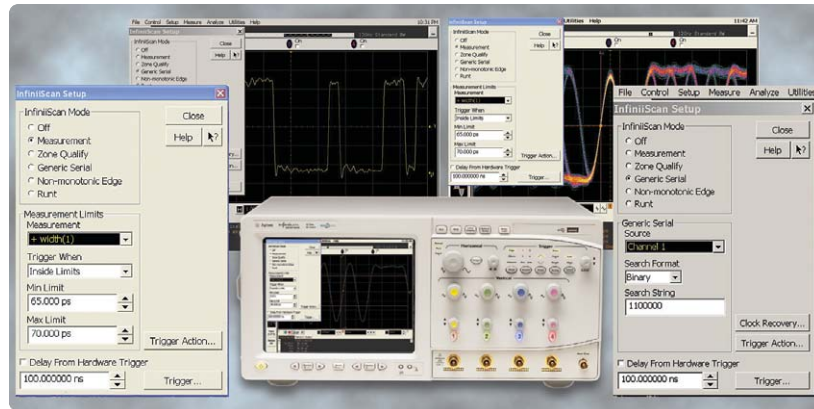
Consideration	Classic methods	InfiniiScan software
Number of events that can be monitored simultaneously	One, the hardware trigger event	Up to five different events or the same event on four channels
Number of occurrences of that event that can be identified	One, the occurrence at the hardware trigger point	Unlimited number of events within the acquired time window
Variety of events that can be identified	Approximately ten, fixed and limited by hardware triggering capabilities	Software descriptions provide increased event definition flexibility
Maximum speed of events that can be isolated	Minimum input setting of 300 ps, limited by hardware triggering circuits	Events as narrow as 70 ps can be isolated, limited only by sample rate resolution
Difficulty in defining the proper setup to capture the event	Requires triggering expertise. Many people end up pressing the Single key many times.	If you can see it, you can capture it using the zone qualify capability or any of InfiniiScan's other power isolation mechanisms
Finding an event of interest in a deep memory capture	Manually inspecting waveforms is impractical, as 1 Mpoint of memory represents 10,000 screens of waveforms	Scope scans the waveform so you don't have to, and no programming is required

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InfiniiScan overcomes these classic limitations by automatically inspecting each signal it acquires and informing you of any potential signal integrity issues it discovers. InfiniiScan moves an oscilloscope a few steps closer to the ideal of a "Find Problem" button. With Agilent InfiniiScan, you can monitor up to five different events or the same event on four channels simultaneously. InfiniiScan can also isolate events as narrow as 70 ps – well beyond the limitations of hardware-based approaches. With InfiniiScan, there is no need to manually inspect waveforms as InfiniiScan will scan a waveform automatically to identify a single waveform anomaly out of 10,000 screens of data without requiring programming.

Agilent InfiniiScan consists of two components, InfiniiScan software finders and measurement limit test.
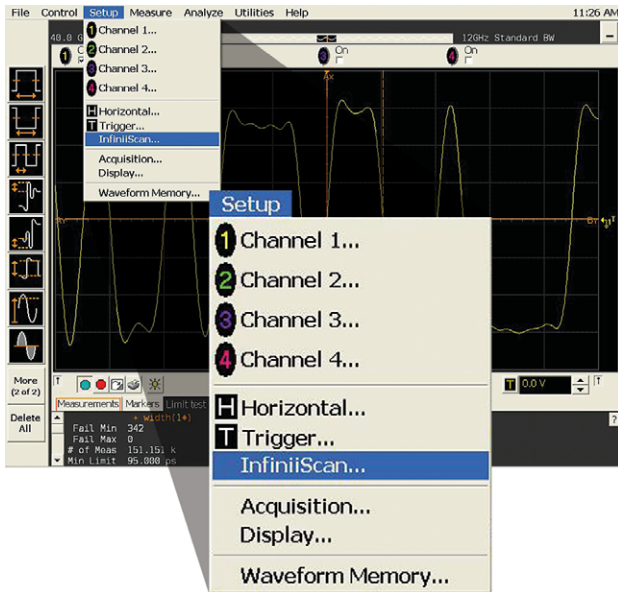

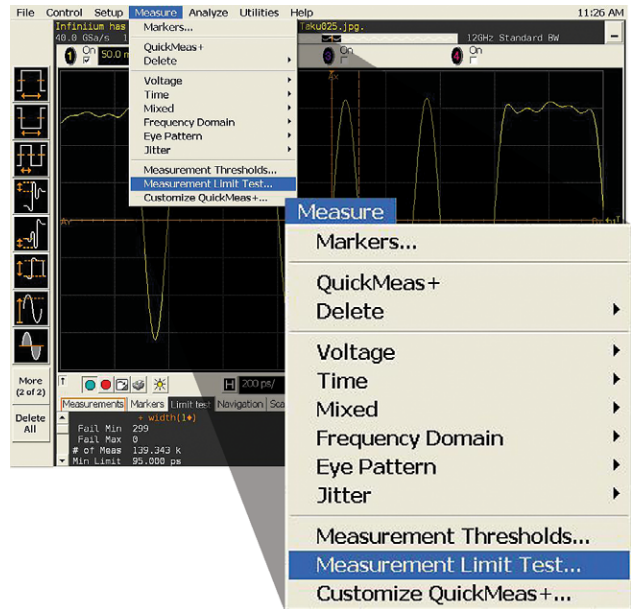**Figure 1. InfiniiScan software finders**

Figure 2. InfiniiScan measurement limit test

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InfiniiScan Software Finders

InfiniiScan software finders consists of five unique features: measurement finder, zone qualify finder, generic serial pattern finder, non-monotonic edge finder and runt finder.

Measurement finder allows you to set boundary conditions to the specified measurement results (inside/outside limits). The oscilloscope will then tell you if it finds such an event. For example, you can set a measurement finder to have the oscilloscope identify a rise time you specify.
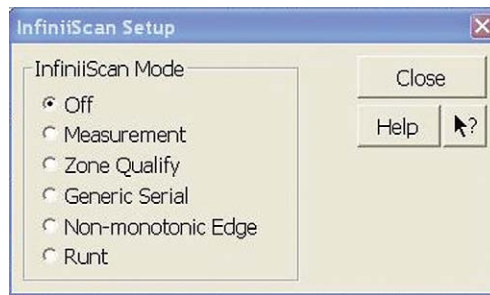
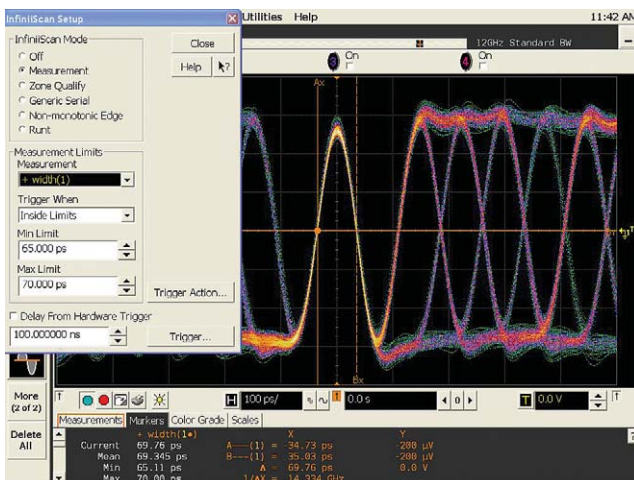

Figure 3. InfiniiScan software finder dialog

Figure 4. InfiniiScan measurement finder identifies a glitch that occurs between 65 ps and 75 ps
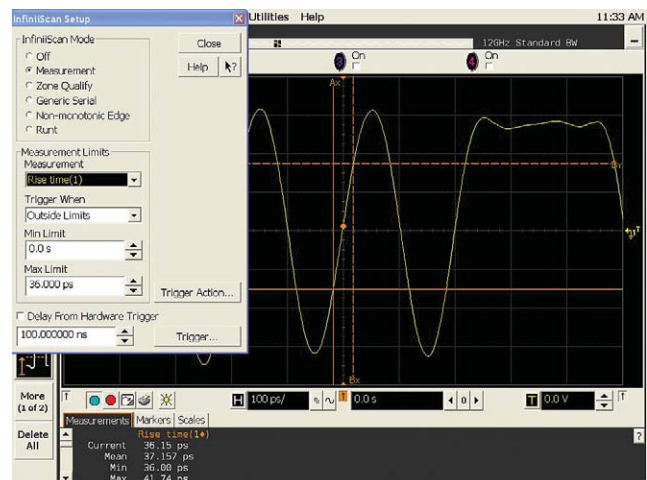

Figure 5. InfiniiScan measurement finder identifies a rise-time slower than 36 ps in order to locate ISI issues that are occurring on a single-bit pulse

InfiniiScan Software Finders (continued)

The *zone qualify finder* allows you to draw a "must pass" and a "must not pass" zone on the oscilloscope screen to visually determine the event identification condition. Essentially, if you can see the event of interest on the screen, you can quickly isolate it without having to try to figure out how to set up a trigger or needing to repeatedly press the Single key.

The *generic serial finder* lets you set up to an 80-bit serial pattern for the oscilloscope to identify up to 8.5 Gbs. Hardware solutions are currently limited to 40 bits and a maximum speed of 3.125 Gbs. Serial patterns can be expressed in hexadecimal or binary. User-definable CDR (clock data recovery) methods are available. Fixed-frequency CDR is standard. Other CDR methods (PLL, explicit, etc.) are available if ordered in conjunction with Agilent's EZJIT jitter analysis or serial data analysis software packages.
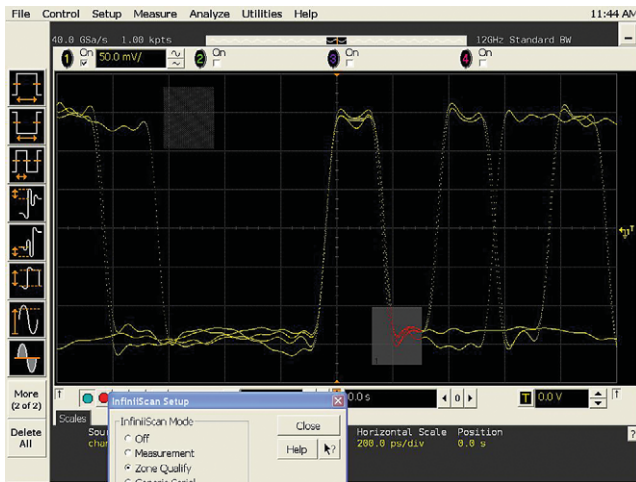

Figure 6. The InfiniiScan zone qualify finder is used to isolate single-bit pulses. Only the waveforms that pass the must-not-intersect (upper left) and must-intersect (lower right) graphical zones are displayed.

Figure 7. InfiniiScan's generic serial finder is used to isolate a specific portion of a high-speed serial data stream.

InfiniiScan Software Finders (continued)

InfiniScan's *runt finder* allows you to identify under-sized signal pulses to resolutions that are beyond the capability of hardware approaches by using hysterisis and threshold levels you specify.

The *non-monotonic edge finder* is a unique capability of InfiniiScan. It allows you to identify non-monotonic edges caused by signal reflections. This feature is strongly demanded by the test and measurement industry to help identify poor signal terminations. There is no method for finding such an event with hardware triggering.

Note that the InfiniiScan software finders can be used in conjunction with the Infiniium oscilloscope hardware trigger via the delay from hardware trigger control. This provides two-level sequencer functionality – hardware trigger followed by software finder with a specified delay between events. You can use the delay capability to facilitate a higher percentage of pre-finder or post-finder information.
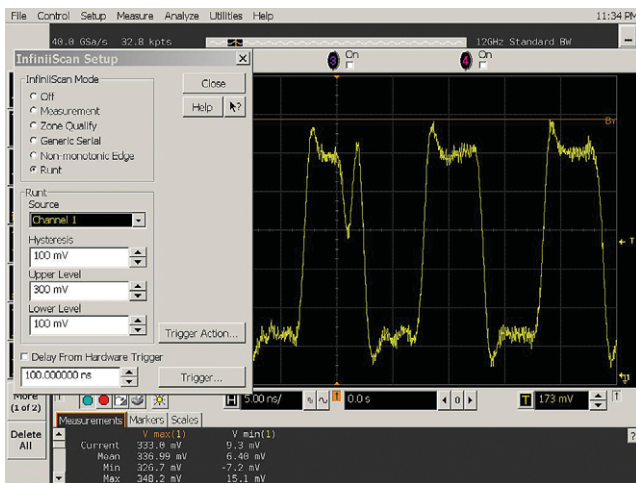
Figure 8. InfiniiScan's runt finder can be used to isolate runt pulses that occur in a signal.
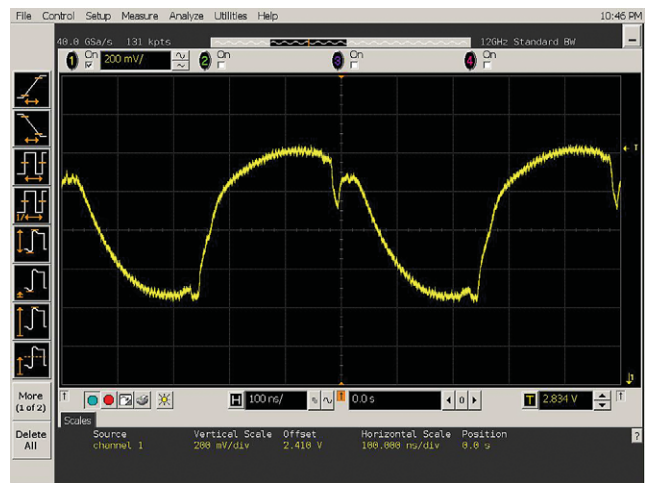
Figure 9. InfiniiScan's non-monotonic edge finder isolates a signal anomaly caused by a poor termination.

InfiniiScan Measurement Limit Test

InfiniiScan measurement limit test counts the number of violations against specified measurement value conditions. This feature lets you set up to five different conditions over all channels. For example, you can monitor the valid rise time window for channel 1 while monitoring the valid signal period window on channel 3. The navigation capability of measurement limit test will move the display to the exact location of any and all anomalous events that have been identified on every waveform. This navigation capability is also not possible with hardware-based approaches or any previous oscilloscope software package.

Measurement limit test operation

• Choose up to five measurements (measurements must be turned on prior to starting InfiniiScan measurement identification)

• Define unacceptable ranges (in range, out of range)

• Scope scans waveforms

• Acquire and repeat until found

• Navigate to anomalous events

• Actions on failure: stop, print, e-mail, screen shot, save setup, save waveform, measurement

The InfiniiScan software will not replace the use of hardware triggering for capturing rare anomalies that occur more infrequently than 1 ms to 1 sec. However, InfiniiScan will make better use of the scope's acquisition memory and the scope's hardware triggering system by augmenting these traditional capabilities in new ways via InfiniiScan's innovative searching, measuring and scanning techniques. InfiniiScan identifies signal integrity issues previously difficult or impossible to find with traditional hardware triggering or deep memory approaches, making it a valuable addition to your toolbox for many oscilloscope applications.
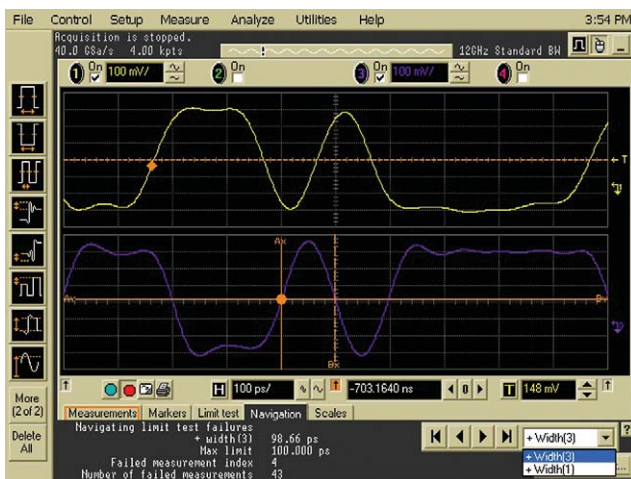

Figure 10. InfiniiScan measurement limit test identifying glitches on two channels simultaneously. Navigation controls (first, previous, next, last) also shown.
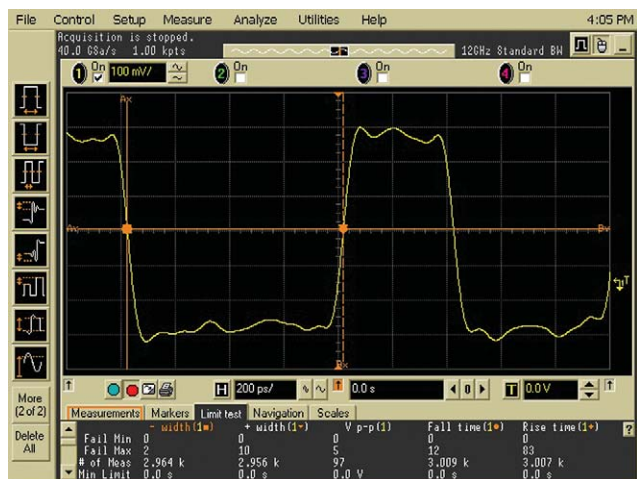

Figure 11. InfiniiScan measurement limit test simultaneously monitoring five different events (positive pulse width, negative pulse width, peak to peak voltage, fall time and rise time) on a single signal.

Ordering Information

Model	Description
N5414A	InfiniiScan Event Identification Software for Infiniium 80000 and 54850 Series
N5415A	InfiniiScan Event Identification Software for Infiniium 8000 and 54830 Series

Related Literature

Publication Title	Publication Type	Publication Number
Infiniium 80000B Series Oscilloscopes InfiniiMax Series Probes	Data Sheet	5989-4604EN
Infiniium 8000 Series Oscilloscopes	Data Sheet	5989-4271EN

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